

## CLAIMS :

1. A method of automatic translation of sentences from a source language  $L_s$  selected from language  $L_1$  to  $L_n$  to a target language  $L_t$  selected from languages  $L_1$  to  $L_n$  comprising the steps of:
  - (i) providing grammars  $G_1$  to  $G_n$  of all the languages  $L_1$  to  $L_n$  respectively and a text 'S' in the source language  $L_s$  as inputs;
  - (ii) creating a unified grammar specification UG for the grammars  $G_1$  to  $G_n$ ;
  - (iii) separating the input text 'S' in the source language  $L_s$  into a list of tokens using a lexical analyser for the source language  $L_s$ ;
  - (iv) setting a non-terminal symbol 'E' to the start symbol of the unified grammar specification UG;
  - (v) obtaining a set of grammar production rules  $P_e$  which define the rules to reduce a string of terminal symbols and/or non-terminal symbols to the target non-terminal symbol E from the unified grammar specification UG;
  - (vi) for each unified grammar production rule  $P$  in the set of grammar production rules  $P_e$  taking each symbol one by one from a list of terminal symbols and/or non-terminal symbols corresponding to the source language grammar  $G_s$ , determining whether it is a terminal symbol or a non-terminal symbol;

- (vii) for each terminal symbol obtained from the previous step, which is equivalent to a corresponding symbol in the list of tokens T of the input text in the source language  $L_s$ , considering the next symbol in said list of terminal symbols and/or non-terminal symbols corresponding to the source language grammar  $G_s$  and for each non-terminal symbol obtained from the previous step which refers to another non-terminal symbol  $E_s$ , of the unified grammar specification UG, repeating step (v) onwards with the new non-terminal symbol  $E_s$ ;
- (viii) if all the symbols in the said list of terminal symbols and/or non-terminal symbols corresponding to the source language grammar  $G_s$  match with all the symbols in the list of tokens T of the input text in the source language  $L_s$ , obtaining a list of symbols t corresponding to the target language grammar  $G_t$  from the unified grammar production rule P and for those symbols which do not match, repeating step (vi) onwards for the next unified grammar production rule P defined for the non-terminal symbol 'E';
- (ix) taking each symbol one by one, from the list of symbols t corresponding to the target grammar  $G_t$  and determining whether it is a terminal symbol or a non-terminal symbol;
- (x) for each terminal symbol obtained from the previous step outputting the symbol, and considering the next symbol and for each non-terminal

obtained from the previous step, obtaining another unified grammar production rule  $P$  corresponding to that non-terminal symbol and repeating the previous step with the new unified grammar production rule, till all the symbols in the list of symbols  $t$  corresponding to the target language grammar  $G_t$  are exhausted.

2. The method as claimed in claim 1, wherein the unified grammar specification  $UG$ , for the grammars  $G_1$  to  $G_n$  of languages  $L_1$  to  $L_n$ , is created by the steps of :
  - (i) for every production rule  $P$  of the grammars  $G_1$  to  $G_n$  of the languages  $L_1$  to  $L_n$ , defining a unified production rule  $P_1$  in the unified grammar specification  $UG$  having the target non-terminal symbol of the production rule  $P$  as its target non-terminal symbol; and
  - (ii) for each grammar  $G_1$  to  $G_n$  creating a list of terminal symbols and/or non-terminal symbols in the said production rule  $P_1$  and adding each and every symbol in the list of terminal symbols and/or non-terminal symbols that are represented by the target non-terminal symbol in the production rule  $P$  to the said unified production rule  $P_1$  and repeating previous step for the next production rule of the grammars  $G_1$  to  $G_n$ .